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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,736	02/10/2004	Stephen Moxham	108298633US2	1541
25096	7590	01/21/2005	EXAMINER	
PERKINS COIE LLP			BEREZNY, NEMA O	
PATENT-SEA			ART UNIT	
P.O. BOX 1247			2813	
SEATTLE, WA 98111-1247			PAPER NUMBER	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/775,736	Applicant(s) MOXHAM ET AL.	
	Examiner Nema O. Berezny	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 88-124 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 88-124 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>02102004:08022004</u> .   | 6) <input type="checkbox"/> Other: ____.                                    |

### DETAILED ACTION

Claims 88-124 are currently pending; cancellation of claims 1-87 is acknowledged.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 122-123 are rejected under 35 U.S.C. 102(a) as being anticipated by Hembree et al. (6,300,782). Hembree discloses a method for supporting a microelectronic substrate, comprising: attaching the microelectronic substrate (Figs.5A,5B el.24) to a support member (el.68D) having a first surface and a second surface facing opposite from the first surface, the support member further having a connection structure that includes first (71D) and second bond sites (14C), the first bond site being positioned at least proximate to the first surface of the support member, the second bond site being positioned at least proximate to the second surface of the support member, the connection structure further including at least two elongated members (el.70) connected to and extending outwardly from the first bond site, at least one of the elongated members being coupled (el.76D) between the first and second bond sites; electrically coupling the second bond site to the microelectronic substrate (Fig.5B); and disposing a flowable conductive material (el.70) on the first bond site

Art Unit: 2813

**[claim 122]**. Hembree also discloses wherein electrically coupling the second bond site to the microelectronic substrate includes connecting a wire bond (el.34) between the second bond site and the microelectronic substrate (Fig.5A) **[claim 123]**.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 88-97, 99-120, and 124 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 122 above, and further in view of Zakel et al. (6,277,660). Hembree also discloses a method for coupling a flowable conductive material to a microelectronic device, comprising: aligning a support member (el.68D) to receive a flowable conductive material, the support member having a support surface configured (el.10D) to carry a microelectronic substrate (el.24), the support member further having a first connection structure (el.70) and a second connection structure (el.22B), the first connection structure being configured to remain decoupled from a microelectronic substrate when the support member carries the microelectronic substrate, the first connection structure having a first bond site (el.71D) configured to receive the flowable conductive material, the second connection structure having a second bond site (el.14C) configured to receive the flowable conductive material and be electrically coupled to the microelectronic substrate when the support member carries

Art Unit: 2813

the microelectronic substrate (Fig.5B); disposing a first quantity (el.70) of the flowable conductive material on the first bond site to form a first conductive coupler; and disposing a second quantity (el.22B) of the flowable conductive material on the second bond site to form a second conductive coupler. However, Hembree does not disclose wicking a first or second quantity of flowable conductive material. Hembree would look to one such as Zakel for a good contact because Zakel discloses wicking a first portion of the first quantity of flowable conductive material along first elongated members connected to and extending outwardly from the first bond site such that the first conductive coupler projects away from the first bond site in an at least approximately normal direction by a first distance (Fig.6); and wicking a second portion of the second quantity of flowable conductive material along second elongated members extending outwardly from the second bond site such that the second conductive coupler projects away from the second bond site (Fig.6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the wicking of Zakel with the method of Hembree to insure a good contact during testing (Zakel – col.2 lines 43-60). Hembree in view of Zakel do not disclose an equal volume of first and second portions of flowable conductive material. Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16

Art Unit: 2813

USPQ2d 1934, 1936 (Fed. Circ. 1990) [**claims 88, 106, 107, 114, 115, 116, 117, 119, 124**].

5. Based upon the rejection of claims 88 and 106 above, Zakel discloses wherein wicking the first portion includes wicking the first portion along a first number of first elongated members (el.12), and wherein wicking the second portion includes wicking the second portion along a second number of second elongated members (el.12), with the first number equal to the second number. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the wicking of Zakel with the method of Hembree to insure a good contact during testing (Zakel – col.2 lines 43-60) [**claims 89, 108**].

6. Based upon the rejection of claims 88, 106, and 116 above, Hembree discloses a method for supporting a microelectronic substrate, comprising: attaching the microelectronic substrate (el.24) to a support member (el.68D) having a connection structure with a bond site configured to receive a flowable conductive material, the connection structure further having at least two elongated members connected to and extending outwardly from the bond site, each elongated member being configured to receive at least a portion of the flowable conductive material from the bond site; and electrically coupling the microelectronic substrate to the support member without electrically coupling the microelectronic substrate to any of the elongated members of the connection structure (Fig.5B); and testing (el.72D) the microelectronic substrate by contacting a test fixture with the flowable conductive material on the first and second connection structures [**claims 90, 111, 112**]; selecting the second connection structure

to include a third bond site configured to be wire bonded (el.34) to the microelectronic substrate when the microelectronic substrate is carried by the support member, and wherein and at least one of the second elongated members (el.78D) extends between the second and third bond sites **[claim 91]**; selecting the first connection structure to include at least one electrically conductive metallic material (col.6 lines 38-42) **[claim 96]**; attaching a microelectronic substrate to the support member; and electrically coupling the microelectronic substrate to the second connection structure (Fig.5B; col.12 lines 48-55) **[claim 99]**; selecting the first connection structure to have two elongated members (Fig.5B el.71D) **[claim 100]**; selecting the first connection structure to have three elongated members (Fig.5B el.71D) **[claim 101]**; anchoring (Fig.5B el.64) an end of at least one of the elongated members to the support member **[claim 102]**; attaching a microelectronic substrate to the support surface of the support member, and connecting the microelectronic substrate to the second connection structure by passing a wire (el.76D) from the microelectronic substrate through an aperture in the support surface and to the second connection structure (Fig.5B) **[claim 104]**; wherein disposing the first quantity of flowable conductive material includes forming a first solder ball projecting away from the first bond site by a first distance, and wherein disposing the second quantity of flowable conductive material includes forming a second solder ball projecting away from the second bond site by a second distance at least approximately equal to the first distance (Fig.5A) **[claim 105]**; wherein the connection structure is a first connection structure and the elongated members are first elongated members, and wherein electrically coupling the microelectronic substrate to the support member

Art Unit: 2813

includes electrically coupling the microelectronic substrate to a second connection structure carried by the support member, the second connection structure having a second bond site configured to receive a flowable conductive material, the second connection structure having second elongated members extending outwardly from the second bond site, wherein each of the second elongated members is configured to receive at least a portion of the flowable conductive material from the second bond site (Fig.5A) **[claim 113]**; electrically coupling at least one of the elongated members to the first bond site of the microelectronic substrate (Fig.5B) **[claim 118]**; and wherein disposing the connection structure on the microelectronic substrate includes depositing a metal redistribution layer on the microelectronic substrate (col.5 lines 27-31) **[claim 120]**.

7. Based upon the rejection of claims 88 and 106 above, Zakel discloses wherein wicking the first portion of flowable conductive material includes wicking the first portion along two first elongated members extending away from opposite sides of the first bond site (Fig.6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the wicking of Zakel with the method of Hembree, wherein less alignment accuracy would be necessary **[claims 92, 109]**.

8. Based upon the rejection of claims 88 and 106 above, Zakel discloses disposing a layer (Fig.6 el.13) on the support member and on the first and second elongated members; and aligning a first aperture (el.15) of the layer with the first bond site (el.12) and aligning a second aperture of the layer with the second bond site; and disposing a layer on the support member and over the first and second elongated members with a



Art Unit: 2813

first aperture of the layer aligned with the first bond site and a second aperture of the layer aligned with the second bond site, further wherein a covered portion of each first and second elongated member extends between the layer and the support member, and an exposed portion of each elongated member is exposed through one of the first and second apertures, still further wherein each exposed portion has approximately the same length (Fig.4). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the disposing and aligning of Zakel with the method of Hembree in order to align the solder with the bond pad **[claims 93, 94, 110]**.

9. Based upon the rejection of claim 88 above, Hembree does not disclose a solder pad diameter, or an elongated member length or width. Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Circ. 1990) **[claims 95, 97, 103]**.

10. Claims 98 and 121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree in view of Zakel as applied to claims 88 and 116 above, and further in view of Wada (6,682,948). Hembree in view of Zakel do not disclose plating the first connection structure, or disposing a first and second passivation layer. However, Hembree and Zakel would look to one such as Wada for a continuous conductive layer because Wada discloses temporarily coupling at least one of the first elongated

Art Unit: 2813

members to a plating bus; applying electrical current to the plating bus to plate the first connection structure; and decoupling the first elongated members from the plating bus (col.10 lines 40-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the plating of Wada with the method of Hembree and Zakel in order to provide a continuous conductive layer **[claim 98]**. Wada also discloses disposing a first passivation layer between the second surface of the microelectronic substrate and the first surfaces of the elongated members; and disposing a second passivation layer adjacent to the second surfaces of the elongated members (col.9 lines 53-60). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the passivation layers of Wada with the method of Hembree and Zakel in order to provide isolated conductive areas **[claim 121]**.

### ***Conclusion***

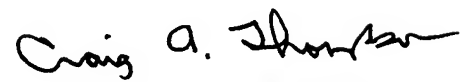
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nema O. Berezny whose telephone number is (571) 272-1686. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NB

  
CRAIG A. THOMPSON  
PRIMARY EXAMINER